AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (cancelled)

2. (currently amended) The torque biasing system of claim ~~1~~ 37 further comprising a clutch operator mechanism that is driven by said motor and that imparts a linear force on said clutch pack.

3. (currently amended) The torque biasing system of claim ~~1~~ 37 wherein said control signal is based on a difference between said torque command and said calculated torque.

4. (currently amended) A ~~The~~ torque biasing system ~~of claim 1~~ comprising:

a clutch pack;

a motor that manipulates engagement of said clutch pack based on a control signal; and

a control module that generates said control signal based on a torque command and a calculated torque, wherein said calculated torque is determined based on a model of said torque biasing system and wherein said motor includes a position sensor that generates an armature position signal, a temperature sensor that generates a temperature signal and a current sensor that generates a current signal, wherein said

calculated torque is determined based on said armature position signal, said temperature signal and said current signal.

5. (currently amended) A ~~The~~ torque biasing system ~~of claim 1~~ comprising:

a clutch pack;

a motor that manipulates engagement of said clutch pack based on a control signal; and

a control module that generates said control signal based on a torque command and a calculated torque, wherein said calculated torque is determined based on a model of said torque biasing system and wherein said clutch pack includes a temperature sensor that generates a temperature signal, wherein said calculated torque is determined based on said temperature signal.

6. (currently amended) The torque biasing system of claim ~~1~~ 37 wherein said model of said torque biasing system includes a motor module, a clutch operator module and a clutch pack module.

7. (previously presented) The torque biasing system of claim 6 wherein said motor module generates a first position signal based on said control signal, a motor armature position, a motor temperature, a motor current, motor data and a resistance torque generated by said clutch operator module.

8. (currently amended) The torque biasing system of claim 6 wherein said clutch operator module generates a second position signal and a resistance torque based on a first position signal generated by said motor module, clutch operator data and a resistance force generated by said clutch module, said second position signal corresponding to said calculated interconnection position.

9. (currently amended) A ~~The~~ torque biasing system ~~of claim 6~~ comprising:

a clutch pack;

a motor that manipulates engagement of said clutch pack based on a control signal; and

a control module that generates said control signal based on a torque command and a calculated torque, wherein said calculated torque is determined based on a model of said torque biasing system, wherein said model of said torque biasing system includes a motor module, a clutch operator module and a clutch pack module, and wherein said clutch module determines said calculated torque and a resistance force based on a second position signal generated by said clutch operator module, clutch data, a clutch temperature and clutch kiss point data.

10. (cancelled)

11. (currently amended) The method of claim ~~10~~ 38 wherein said control signal is based on a difference between said torque command and said calculated torque.

12. (currently amended) A method of ~~claim 10~~ controlling a torque biasing system, comprising:

generating a torque command;

determining a calculated torque based on a model of said torque biasing system;

determining a control signal based on said torque command and said calculated torque; and

controlling said torque biasing system based on said control signal,

wherein said calculated torque is determined based on an armature position, a motor temperature and a motor current.

13. (currently amended) A method of ~~claim 10~~ controlling a torque biasing system, comprising:

generating a torque command;

determining a calculated torque based on a model of said torque biasing system;

determining a control signal based on said torque command and said calculated torque; and

controlling said torque biasing system based on said control signal,

wherein said calculated torque is determined based on a clutch temperature.

14. (currently amended) The method of claim ~~10~~ 38 further comprising generating a first position signal in a motor module based on said control signal, a motor armature position, a motor temperature, a motor current, motor data and a resistance torque generated by a shift system module.

15. (currently amended) The method of claim ~~10~~ 38 further comprising generating a second position signal corresponding to said calculated interconnection position and a resistance torque in a clutch operator module based on a first position signal generated by a motor module, clutch operator data and a resistance force generated by a clutch module.

16. (currently amended) A method of ~~claim 10~~ controlling a torque biasing system, comprising:

generating a torque command;

determining a calculated torque based on a model of said torque biasing system;

determining a control signal based on said torque command and said calculated torque; and

controlling said torque biasing system based on said control signal; and

~~wherein further comprising~~ determining said calculated torque and a resistance force in a clutch model based on a second position signal generated by a clutch operator module, clutch data, a clutch temperature and kiss-point data.

17. (cancelled).

18. (currently amended) The method of claim ~~17~~ 39 further comprising processing a previous control signal through a torque biasing system model to generate said model-based torque.

19. (previously presented) The method of claim 18 wherein said torque biasing system model includes a motor model, a clutch operator model and a clutch model.

20. (previously presented) The method of claim 19 further comprising processing said control signal through said motor model to generate a clutch operator interconnection value.

21. (previously presented) The method of claim 20 wherein said clutch operator interconnection value is generated based on a resistance torque, a motor position signal and motor data.

22. (previously presented) The method of claim 21 further comprising calculating said resistance torque using said clutch operator model.

23. (currently amended) The method of claim 19 further comprising processing an interconnection position value through said clutch operator model to generate said ~~a clutch~~ calculated interconnection position of said clutch ~~value~~.

24. (currently amended) The method of claim 23 wherein said ~~clutch~~ calculated interconnection position ~~value~~ is generated based on a resistance force and clutch operator data.

25. (previously presented) The method of claim 24 further comprising calculating said resistance force using said clutch model.

26. (currently amended) The method of claim 19 further comprising processing ~~a~~ ~~clutch~~ said calculated interconnection position ~~value~~ through said clutch model to generate said model-based torque.

27-36 (cancelled).

37. (new) A torque biasing system, comprising:

a clutch pack;

a motor that manipulates engagement of said clutch pack based on a control signal; and

a control module that generates said control signal based on a torque command and a calculated torque, wherein said calculated torque is based on a calculated interconnection position of said clutch pack and wherein said calculated interconnection position is based on a model of said torque biasing system.

38. (new) A method of controlling a torque biasing system, comprising:

generating a torque command;

calculating an interconnection position of a clutch of said torque biasing system based on a model of said torque biasing system;

determining a calculated torque based on said calculated interconnection position;

determining a control signal based on said torque command and said calculated torque; and

controlling said torque biasing system based on said control signal.

39. (new) A method of controlling a torque biasing system, comprising:

determining a torque command;

calculating a model-based torque based on a calculated interconnection position of a clutch of said torque biasing system;

calculating a torque error based on said torque command and said model-based torque;

generating a control signal based on said torque error; and

operating said torque biasing system based on said control signal.

40. (new) A controller for a torque biasing system including a clutch and a motor that manipulates engagement of said clutch via a clutch operator, the controller comprising:

a motor control module that generates a motor control signal;

a motor module that generates a calculated clutch operator position signal based on said motor control signal;

a clutch operator module that generates a calculated clutch interconnection signal based on said calculated clutch operator position signal;

a clutch module that generates a calculated torque signal based on said calculated clutch interconnection signal;

wherein said motor control signal is based on said calculated torque signal.

41. (new) The controller of claim 40 wherein said calculated clutch operator position signal is generated by said motor module based on motor data including at least one of: current to torque conversion factor data, back EMF constant data, brake-on drag data, brake-off drag data, viscous drag data, coil resistance data, inertia data, and gear ratio data.

42. (new) The controller of claim 40 wherein said calculated clutch operator position signal is generated by said motor module based on at least one of: motor position data, motor temperature data, and motor electrical current data.

43. (new) The controller of claim 40 wherein said calculated clutch interconnection signal is generated by said clutch operator module based on clutch operator data

including at least one of: spring rate data, efficiency data, drag factor data, viscous damper drag factor data, position ratio data, and inertia data.

44. (new) The controller of claim 40 wherein said calculated torque signal is generated by said clutch module based on at least one of: negative clutch force data, nominal kiss point data, kiss point correction data, number of clutch plates data, effective clutch plate radius data, clutch geometry data, clutch temperature data, and wheel slip data.

45. (new) The controller of claim 40 wherein said motor control module receives a torque command signal and generates said motor control signal based on a difference between said torque command signal and said calculated torque signal.